PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 00000PCT7507	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/JP2004/016795	International filing date *(day/month/year)* 05 November 2004 (05.11.2004)	Priority date *(day/month/year)* 14 November 2003 (14.11.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SEMICONDUCTOR ENERGY LABORATORY CO., LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 15 May 2006 (15.05.2006)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	Authorized officer Masashi Honda Telephone No. +41 22 338 70 10

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
SEMICONDUCTOR ENERGY
LABORATORY CO., LTD.

398, Hase, Atsugi-shi,
Kanagawa
2430036
Japan

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	15.2.2005
Applicant's or agent's file reference: 00000PCT7507	FOR FURTHER ACTION: See paragraph 2 below
International application No.: PCT/JP2004/016795	International filing date *(day/month/year)*: 05.11.2004
Priority date *(day/month/year)*: 14.11.2003	
International Patent Classification (IPC) or both national classification and IPC: Int.Cl⁷ G02F 1/1368, G02F 1/1339 [ ], H01L 21/288	
Applicant: SEMICONDUCTOR ENERGY LABORATORY CO., LTD.	

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Date of completion of this opinion: 01.02.2005	
Name and mailing address of the ISA/JP: **Japan Patent Office**, 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer: YAMAGUCHI, Hiroyuki 2X 3411; Telephone No. +81-3-3581-1101 Ext. 3293

Form PCT/ISA/237 (cover sheet) (January 2004)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/016795

Box No. I **Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

   ☐ a sequence listing
   ☐ table(s) related to the sequence listing

   b. format of material

   ☐ in written format
   ☐ in computer readable form

   c. time of filing/furnishing

   ☐ contained in the international application as filed.
   ☐ filed together with the international application in computer readable form.
   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/016795

Box No. V **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-12	YES
	Claims		NO
Inventive step (IS)	Claims	7-12	YES
	Claims	1-6	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations

D1 : JP 2003-318133 A(SEIKO EPSON Co., Ltd.)
2003.11.07, claim 11,20, paragraph [0022], [0036], [0039]

D2 : JP 2003-315829 A(SEIKO EPSON Co., Ltd.)
2003.11.06, claim 15, paragraph [0074]-[0075], Fig.8

Claim 1-6
The subject matter of claims 1-6 do not appear to involve an inventive step in view of the documents 1-2 cited in the ISR.
Claim 11 of D1 discloses the method for forming film pattern by droplet discharge method, and the method includes forming lyophilic and lyophobic patterns. And claim 20 of D1 discloses semiconductor device consisting of source electrode, drain electrode, and gate electrode, which are formed by droplet discharge method. Furthermore, paragraph [0036] and [0039] discloses an idea that fluid used in droplet discharge method contains conductive particles, such as gold, silver, palladium, nickel.
Paragraph [0074]-[0075] of D2 discloses an idea that the connecting portion 28 for accomplishing the electrical connection between one side of the source/drain regions 22 and the pixel electrode is formed by droplet discharge method.
Therefore, a person skilled in the art could have easily arrived at the invention in claim 1,2,4 by forming the connecting portion between drain electrode and pixel electrode at the semiconductor device of D1.
Regarding for claim 3, D1 does not disclose an idea of using photocatalyst. However, paragraph [0022] of D1 discloses an idea of making a substrate lyophilic by irradiating UV, and photocatalyst also changes its property by UV. So, a person skilled in the art could have easily arrived at the idea of using photocatalyst.
Regarding for claim 5, thin film transistor including amorphous semiconductor or a semiamorphous semiconductor is well-known.
Regarding for claim 6, using liquid crystal display for television receiver is well-known art.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box No.V

Claim 7-12

The subject matter of claims 7-12 is considered to involve an inventive step over the documents 1-2 cited in the international search report.

D1-D2 do not disclose the steps of:

forming a columnar conductive film over one of the source and drain electrodes;

forming a second insulating film covering the columnar conductive film and the thin film transistor;

or the steps of:

forming a columnar organic film over one of the source and drain electrodes;

forming a second insulating film covering the columnar organic film and the thin film transistor;

removing the columnar organic film.